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Potent cellular and humoral immunity against HIV-1 elicited in mice by a DNA-prime/MVA-boost vaccine regimen intended for human use

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In an experimental vaccine model, mice were primed three times with plasmids encoding multiple subtypes (A, B and C) of gag, envelope (env) and reverse transcriptase (RT) and adjuvant rGM-CSF followed by modified vaccinica Ankara (MVA) with the recombinant form A_E, in theory providing protection against HIV subtypes A-E. The cellular responses, as measured by IFN-gamma secretion gave up to 2000 gag-specific SFC/million PBMC. The humoral and cellular responses were further increased by the MVA-boosts with env and gag specific ELISpot responses above 3500 secreting/10^6 cells. Intracellular cytokine staining showed remarkably high numbers (~15%) of gag and env specific CD8+ T cells. This paved the way for our clinical trial with the multigene/multisubtype DNA plasmids boosted with the MVA construct. Conclusions: This preclinical study clearly shows the potential of combining these particular DNA and MVAs in a prime/boost regimen and that it is possible to induce a strong and broad humoral and cellular response directed against several parts of HIV as well as to several subtypes of the virus.